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(51) International Patent Classification ⁶ : C12N 15/12, C07K 14/705, C12Q 1/68, G01N 33/53, C07K 16/28, A61K 38/17, 31/70, 39/00, 35/12, 39/395, 48/00	A3	(11) International Publication Number: WO 99/04265 (43) International Publication Date: 28 January 1999 (28.01.99)
(21) International Application Number: PCT/US98/14679		[UA/GB]; 91 Riding House Street, London W1P 8BT (GB).
(22) International Filing Date: 15 July 1998 (15.07.98)		O'HARE, Michael [GB/GB]; 91 Riding House Street, London W1P 8BT (GB). OBATA, Yuichi [JP/JP]; Chikusa-Ku, Nagoya 464 (JP). PFREUNDSCHUH, Michael [DE/DE]; Innere Medizin 1, D-66421 Homburg/Saar (DE). TURECI, Ozlem [DE/DE]; Innere Medizin 1, D-66421 Homburg/Saar (DE). SAHIN, Ugur [TR/DE]; Innere Medizin 1, D-66421 Homburg/Saar (DE).
(30) Priority Data: 08/896,164 17 July 1997 (17.07.97) US 60/061,599 10 October 1997 (10.10.97) US 60/061,765 10 October 1997 (10.10.97) US 08/948,705 10 October 1997 (10.10.97) US 9721697.2 11 October 1997 (11.10.97) GB 09/102,322 22 June 1998 (22.06.98) US		(74) Agent: VAN AMSTERDAM, John, R.; Wolf, Greenfield & Sacks, P.C., 600 Atlantic Avenue, Boston, MA 02210 (US). (81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG). Published <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>
(71) Applicant (for all designated States except US): LUDWIG INSTITUTE FOR CANCER RESEARCH [CH/US]; 605 Third Avenue, New York, NY 10158 (US).		(88) Date of publication of the international search report: 26 August 1999 (26.08.99)

(54) Title: CANCER ASSOCIATED NUCLEIC ACIDS AND POLYPEPTIDES

(57) Abstract

Tumor cell-specific antigens from melanoma cells have previously been identified using autologous cytolytic T cells clones from the patient, but the same approach did not work well with other tumour types. Here, screening of such antigens was successfully performed using antisera from the patient. Provided are several tumor cell-specific antigens, nucleic acids encoding them, antibodies and CTL's directed against these antigens, antigenic fragments diagnostic kits, etc.

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A. CLASSIFICATION OF SUBJECT MATTER

IPC 6	C12N15/12	C07K14/705	C12Q1/68	G01N33/53	C07K16/28
	A61K38/17	A61K31/70	A61K39/00	A61K35/12	A61K39/395
	A61K48/00				

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 C12N C07K A61K G01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category ^a	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>WO 97 17470 A (HOLLAND JAMES F) 15 May 1997</p> <p>Also against claims 82-84,116,117 see whole document, particularly the claims</p> <p>---</p> <p>-/-</p>	<p>1,2, 4-10,18, 21-23, 27,28, 31,32, 40,42, 44,45, 48-51, 58-60, 67-70, 76-79</p>

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
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Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl Fax: (+31-70) 340-3016	Authorized officer
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Smalt, R

INTERNATIONAL SEARCH REPORT

International Application No PCT/JP 98/14679

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	GB 2 273 099 A (ASTA MEDICA AG) 8 June 1994 Also against claims 108,109,116,117. See whole document, particularly the claims and examples. ---	1,2, 4-10,31, 32,40, 42,43, 49,50, 58-60, 67,69, 71,72, 74-79, 82-84, 99-104
X	WO 97 17441 A (KISHIMURA MASAAKI ;OSAKADA FUMIO (JP); OSAKI SHOICHI (JP); NAKAO K) 15 May 1997 see the whole document -& EP 0 869 176 A (KANEKA CORPORATION, OSAKA, JAPAN) 7 October 1998 Also against claims 68-72,74,76,77,82,116,117 see claims 10-12; examples 2,5 ---	1,2,4-8, 13,18, 21,22, 24, 27-29, 31,32, 35,40, 42,44, 45, 47-50, 54,59, 60,63,67
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International Application No

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Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>VAUGHAN, J.H. ET AL.: "Epstein-Barr virus-induced autoimmune responses." JOURNAL OF CLINICAL INVESTIGATION, vol. 95, no. 3, March 1995, pages 1306-15, XP002103180</p> <p>see the whole document -& DATABASE EMBL - EMMHUM1 Entry HSIGGAUA, Acc.no. L38696, 17 February 1995</p> <p>VAUGHAN, J.H. ET AL.: "Homo sapiens autoantigen p542 mRNA, complete cds." XP002103198</p> <p>see the whole document</p> <p>---</p>	1,2,18, 21,22, 24, 27-29, 31,35, 40,44, 45, 47-50, 54,59, 60,63, 67-72, 74-80,82
X	<p>MASHIMO, J. ET AL.: "Decrease in the expression of a novel TGF beta1-inducible and ras-revision gene, TSC-36, in human cancer cells." CANCER LETTERS, vol. 113, March 1997, pages 213-9, XP002104545</p> <p>see abstract</p> <p>---</p>	1,2, 4-10,13
X	<p>MACHIELS, B.M. ET AL.: "Nuclear lamin expression in normal testis and testicular germ cell tumours of adolescents and adults." JOURNAL OF PATHOLOGY, vol. 182, no. 2, June 1997, pages 197-204, XP002104546</p> <p>see abstract</p> <p>see page 198, left-hand column, paragraph 2</p> <p>---</p>	1,2, 4-10,15, 31,32, 37,40, 42,116, 117
X	<p>COATES, P.J. ET AL.: "Identification of the antigen recognized by the monoclonal antibody BU31 as lamins A and C" JOURNAL OF PATHOLOGY, vol. 178, no. 1, January 1996, pages 21-9, XP002104547</p> <p>see abstract</p> <p>---</p> <p>-/-</p>	1,2, 4-10,15, 31,32, 37,40, 42,116, 117

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Category ²	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	ZWIJSEN, A. ET AL.: "Characterization of a rat C6 glioma-secreted follistatin-related protein (FRP); cloning and sequencing of the human homologue." EUROPEAN JOURNAL OF BIOCHEMISTRY, vol. 225, no. 3, November 1994, pages 937-46, XP002103181 see page 945, right-hand column, paragraph 2-4; figure 3 ---	18,21, 22,24, 27,28, 44,45, 47-50, 54,59, 60,63, 67-72, 74-80,82
X	MINEGISHI, M. ET AL.: "Structure and function of Cas-L, a 105 kD Crk-associated substructure-related protein that is involved in beta-1 integrin-mediated signaling in lymphocytes." JOURNAL OF EXPERIMENTAL MEDICINE, vol. 184, no. 4, 1 October 1996, pages 1365-75, XP002103183 also against claims 116 and 117 see figure 4 ---	18, 21-23, 27-29, 31,32, 37,40, 44,45, 47-50, 56, 58-60, 65, 67-72, 74-80, 82-84
X	JIN, Y-J. ET AL.: "The 25-kDa FK506-binding protein is localized in the nucleus and associated with casein kinase II and nucleolin." PROC.NAT'L.ACAD.SCI.USA, vol. 90, August 1993, pages 7769-73, XP002104548 see the whole document ---	31,32, 35,40, 116,117
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X	ONO M ET AL: "NUCLEOTIDE SEQUENCE OF HUMAN ENDOGENOUS RETROVIRUS GENOME RELATED TO THE MOUSE MAMMARY TUMOR VIRUS GENOME" JOURNAL OF VIROLOGY, vol. 60, no. 2, 1 November 1986, pages 589-598, XP000673638 see page 597, left-hand column, paragraph 5 - right-hand column, paragraph 1; figure 1 ---	44,45, 47,48, 59,60, 67-72,74
X	DATABASE EMBL - EMEST16 Entry HSC9958, Acc.no. C15995, 29 September 1996 FUJIWARA, T. ET AL.: "Human fetal brain cDNA 5'-end GEN-421G02." XP002103191 see the whole document ---	44,59, 60,63, 67-70
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X	DATABASE EMBL - EMEST15 Entry HSA07407, Acc.no. AA007407, 28 July 1996 HILLIER, L. ET AL.: "zh97b08.r1 Soares fetal liver spleen 1NFLS S1 Homo sapiens cDNA clone 429207 5'" XP002103193 see the whole document ---	44,59, 60,63, 67-70
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Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	HUNG, D.T. ET AL.: "cDNA cloning of a human 25 kDa FK506 and rapamycin binding protein." BIOCHEMICAL AND BIOPHYSICAL RESEARCH COMMUNICATIONS, vol. 184, no. 2, 30 April 1992, pages 733-8, XP002103178 see figure 2 ---	44, 59, 60, 63, 67-70
X	JIN, Y-J. ET AL.: "Molecular cloning of a 25-kDa high affinity rapamycin binding protein, FKBP25." JOURNAL OF BIOLOGICAL CHEMISTRY, vol. 267, no. 16, 5 June 1992, pages 10942-5, XP002104550 see figure 3 ---	44, 47-50, 54, 59, 60, 63, 67-72, 75, 83, 84
X	MACLEOD, A.R. ET AL.: "A muscle-type tropomycin in human fibroblasts: evidence for expression by an alternative RNA splicing mechanism." PROC.NAT'L.ACAD.SCI.USA, vol. 82, December 1985, pages 7835-9, XP002103179 see figures 2,3 ---	44, 59, 60, 63, 67-70
X	DATABASE EMBL - EMEST20 Entry/Acc.no. T09468, 8 August 1993 ADAMS, M.D. ET AL.: "EST07361 Homo sapiens cDNA clone HIBBU63 5' end." XP002103195 see the whole document -& ADAMS, M.D. ET AL.: "Rapid DNA sequencing (expressed sequence tags) from a directionally cloned human infant brain cDNA library." NATURE GENETICS, vol. 4, 1993, pages 373-380, XP000574910 see the whole document ---	44, 45, 67, 70
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Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE EMBL - EMEST15 Entry HSAA33416, Acc.no. AA133416, 6 December 1996 HILLIER, L. ET AL.: "zk96e08.r1 Soares pregnant uterus NbHPU Homo sapiens cDNA clone 490694 5'." XP002103196 see the whole document ---	44,45, 67,70
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X	DATABASE EMBL - EMEST17 Entry HSW22160, Acc.no. W22160, 9 May 1996 NATHANS, J.: "63A6 Human retina cDNA Tsp509I-cleaved sublibrary Homo sapiens cDNA not directional." XP002103201 see the whole document ---	44,45, 60,62, 67,70
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Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE EMBL - EMEST16 Entry HSAA51187, Acc.no. AA151187, 15 December 1996 HILLIER, L. ET AL.: "zo03c11.r1 Stratagene colon (#937204) Homo sapiens cDNA clone 566612 5'." XP002103208 see the whole document ---	44,45, 60,62, 67,70
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X	LI, H. ET AL.: "Isolation and sequence analysis of the human syntaxin-encoding gene." GENE, vol. 143, 1994, pages 303-4, XP002103182 see the whole document ---	44,45, 47,48, 59,60, 65, 70-72, 74,83,84
X	DATABASE EMBL - EMEST11 Entry HS1188646, Acc.no. AA285170, 5 April 1997 STRAUSBERG, R.: "zs48f04.s1 NCI CGAP GCB1 Homo sapiens cDNA clone IMAGE:700735 3'." XP002103210 see the whole document ---	44,45, 59,60, 67-70
X	FISHER, D.Z. ET AL.: "cDNA sequencing of nuclear lamins A and C reveals primary and secondary structural homology to intermediate filament proteins." PROC.NAT'L.ACAD.SCI.USA, vol. 83, September 1986, pages 6450-4, XP002103184 see figure 2 ---	44,45, 59,60, 67-70
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X	DATABASE EMBL - EMEST20 Entry MMAA84412, Acc.no. AA184412, 19 February 1997 MARRA, M. ET AL.: "mt34f07.r1 Soares mouse 3NbMS Mus musculus cDNA clone 622981 5' similar to SW:OXYB_HUMAN P22059 OXYSTEROL-BINDING PROTEIN." XP002103194 see the whole document ---	67-70
A	WO 96 29409 A (LUDWIG INST CANCER RES ;UNIV LEIDEN (NL)) 26 September 1996 see the whole document	1-11, 17-33, 39-52, 58-61, 67-117
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A	WO 95 23874 A (LUDWIG INST CANCER RES) 8 September 1995 see page 5, line 10-14; claims 3,4,7; examples 33,36,43,44 ---	1-4
A	FRANZÉN, B. ET AL.: "Analysis of polypeptide expression in benign and malignant human breast lesions: down-regulation of cytokeratins." BRITISH JOURNAL OF CANCER, vol. 73, 1996, pages 1632-8, XP002104551 see abstract ---	1,2,4-9, 13
A	WO 96 10413 A (LUDWIG INST CANCER RES) 11 April 1996 see the whole document, particularly the claims see abstract ---	3,19,20, 26,39
		-/-

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Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	BOON T ET AL: "Tumor antigens recognized by T cells" IMMUNOLOGY TODAY, vol. 18, no. 6, June 1997, page 267-268 XP004068293 see the whole document ---	
A	SAHIN, U. ET AL.: "Human neoplasms elicit multiple specific immune responses in the autologous host." PROC.NATL.ACAD.SCI.USA, vol. 92, December 1995, pages 11810-3, XP002091914 cited in the application see the whole document ---	
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P,X	ALAIYA, A.A. ET AL.: "Phenotypic analysis of ovarian carcinoma: polypeptide expression in benign, borderline and malignant tumors." JOURNAL OF CANCER, vol. 73, no. 5, 27 November 1997, pages 678-83, XP002104552 see abstract; figure 2 ---	1-10,15
P,X	GÜRE, A.O. ET AL.: "Human lung cancer antigens recognized by autologous antibodies: definition of a novel cDNA derived from the tumor suppressor gene locus on chromosome 3p21.3" CANCER RESEARCH, vol. 58, 1 March 1998, pages 1034-41, XP002103188 see the whole document ---	1,2,4,5, 9,14,18, 21,22, 27,44, 45,49, 50,55, 59,60, 64, 67-70, 83,84
P,X	SCANLAN, M.J. ET AL.: "Characterization of human colon cancer antigens recognized by autologous antibodies" INTERNATIONAL JOURNAL OF CANCER, 29 May 1998, pages 652-8, XP002103186 see the whole document ---	31,32, 34,40, 59,60, 62, 67-70, 83,84, 116 -/-

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	<p>NAGASE, T. ET AL.: "Prediction of the coding sequence of unidentified human genes. IX. The complete sequence of 100 new cDNA clones from brain which can code for large proteins in vivo." DNA RESEARCH, vol. 5, 28 February 1998, pages 31-39, XP002103187 see figure 1; table 3 -& DATABASE EMBL Entry/acc.no. AB011172, 10 April 1998 NAGASE, T. ET AL.: "Homo sapiens mRNA for KIAA0600 protein, partial cds." XP002104556 see the whole document</p> <p>---</p>	44,45, 67-70, 83,84
P,X	<p>JONES, M.H. ET AL.: "Identification and characterization of BRDT: a testis-specific gene related to the bromodomain genes RING3 and Drosophila fsh." GENOMICS, vol. 45, no. 3, 1 November 1997, pages 529-34, XP002103185 see page 529, right-hand column, paragraph 2 see page 530, left-hand column, paragraph 2; figure 1 see page 532, right-hand column, paragraph 2</p> <p>---</p>	44,45, 59,60, 67-70, 83,84
P,X	<p>ISHIKAWA K ET AL: "Prediction of the coding sequences of unidentified human genes. X The complete sequences of 100 new cDNA clones from brain which can code for large proteins in vitro" DNA RESEARCH, vol. 5, no. 321, 30 June 1998, pages 169-176, XP002089186 see abstract; figures 1,2; table 2</p> <p>---</p>	44,59, 60,63, 67-70
E	<p>US 5 858 723 A (MUELLER-LANTZSCH NIKOLAUS ET AL) 12 January 1999</p> <p>Also against claims 108,109,116,117 see the whole document</p> <p>---</p> <p>-/-</p>	1,2, 4-10,31, 32,40, 42,43, 49,50, 58-60, 67,69, 71,72, 74-79, 82-84, 99-104

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Internal Application No

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	WO 98 40483 A (HUMAN GENOME SCIENCES INC ;GREENE JOHN M (US); LI YI (US); ROSEN C) 17 September 1998 Also against claims 74,76-80,82-85,88,89, 99-104,108,109,111,116,117. See seq. 24 and the claims. ---	1,2, 4-10,14, 18, 21-24, 27,28, 31,32, 36,40, 44,45, 47-50, 55, 58-60, 64,67-72
E	WO 98 08866 A (WISTAR INST) 5 March 1998 see the whole document ---	1,2
E	WO 98 48015 A (CHUGAI RES INST MOLECULAR MED ;JONES MICHAEL H CHUGAI RESEARC (JP)) 29 October 1998 see whole document, particularly the claims. & DATABASE WPI Derwent Publications Ltd., London, GB; AN 98-583658 XP002103211 see abstract ---	18,22, 23, 27-29, 31,32, 40, 44-50, 58-60, 67-72, 74, 76-78, 85,88, 89,102, 103
E	WO 98 32853 A (GENETICS INST) 30 July 1998 see seq. 7 and 8 see page 6, line 23 - page 8, line 12; claims 20-22 see page 21, line 17 - page 22, line 11 --- -/-	18,21, 22,24, 27-29, 44,45, 47-50, 53,59, 60,62, 67-72, 74, 76-80,82

INTERNATIONAL SEARCH REPORT

International Application No

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
T	<p>SCANLAN, M.J. ET AL.: "Isoforms of the human PDZ-73 protein exhibit differential tissue expression" <i>BIOCHIMICA ET BIOPHYSICA ACTA</i>, vol. 1445, no. 1, 1999, pages 39-52, XP002104553 also for claims 77-80,82-84,116. see the whole document</p> <p>---</p> <p>DRABKIN, H.A. ET AL.: "DEF-3(g16/NY-LU-12), an RNA binding protein from the 3p21.3 homozygous deletion region in SCLC" <i>ONCOGENE</i>, vol. 18, 1999, pages 2589-97, XP002104554 see the whole document</p> <p>-----</p>	
6		

INTERNATIONAL SEARCH REPORTInternational application No.
PCT/US 98/14679**Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)**

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. Claims Nos.: because they relate to subject matter not required to be searched by this Authority, namely:
Although claims 85-111 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.
2. Claims Nos.: because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. Claims Nos.: because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
1-14,17-36,39-55,58-64,67-117; see additional sheets, pages 3-4.
4. No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

The additional search fees were accompanied by the applicant's protest.

No protest accompanied the payment of additional search fees.

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

Invention 1: claims 1-11,17-33,39-52,58-61,67-117,
all partially

The nucleic acid sequence of Seq.ID 1, fragments or complements thereof, and the corresponding polypeptide(s) encoded thereby, and immunogenic and/or HLA binding fragments thereof, optionally as part of a complex with a HLA molecule, an expression vector comprising said nucleic acid, and optionally a human HLA molecule, a host cell transformed with said vector, and an antibody against said polypeptide(s).

Also a method of diagnosing of a disorder characterised by overexpression of said polypeptide(s) and a method for determining regression, progression or onset of a disease associated with overexpression of said polypeptide(s), using agents that specifically bind to said nucleic acid, said polypeptide(s) or complexes of (fragments of) said polypeptide(s) and a HLA molecule. A kit comprising two polynucleotides for the detection of said nucleic acid
Also pharmaceutical preparations

- which enrich the presence of said polypeptide-HLA complex, optionally comprising an adjuvant, or
- which inhibits the expression of said polypeptide(s), or
- comprising an agent that selectively binds said polypeptide, optionally as a conjugate with a diagnostic or therapeutic compound, or
- comprising said nucleic acid, optionally in an expression vector, optionally in a host cell, or
- comprising said polypeptide(s), optionally in combination with an adjuvant, or
- comprising cytolytic T cells, specific for said polypeptide-HLA complex, or
- comprising an antibody against said polypeptide(s).

Inventions 2-119: claims 1-11,13,15,17-33,35,37,
39-52,54,56,58-61,63,65,67-117, all partially (1)

Inventions 2-119: Idem as subject 1 but limited to each of the DNA sequences as in Seq.ID:2-40,66,89-169 (odd numbers), 170,172,174, and 176-210, where invention 2 is limited to Seq.ID:2 and corresponding polypeptides encoded thereby, invention 3 is limited to Seq.ID:3 and corresponding polypeptides encoded thereby,....., and invention 119 is limited to Seq.ID:210 and corresponding polypeptides encoded thereby.

Invention 120: claims 1-10,13,17-32,35,
39-51,54,58-60,63,67-117, all partially

Idem as subject 1 but limited to the DNA sequences seq.ID:211 and 329 and corresponding polypeptides encoded thereby.

Inventions 121-452: claims 1-10,13,16-32,35,38-51, 54,57-60,63,66-117, all partially (1)

Inventions 121-452: Idem as subject 1 but limited to each of the DNA sequences as in Seq.ID:212-328, and 330-543, where invention 121 is limited to Seq.ID:211 and corresponding polypeptides encoded thereby, invention 122 is limited to Seq.ID:212 and corresponding polypeptides encoded thereby,....., and invention 452 is limited to Seq.ID:543 and corresponding polypeptides encoded thereby.

Invention 453: claims 1-10,12,17-32,34,39-51,53, 58-60,62,67-117, all partially

Idem as subject 1 but limited to the DNA sequences seq.ID:544 and 554 and corresponding polypeptides encoded thereby.

Inventions 454 and 455: claims 1-10,12,17-32,34, 39-51,53,58-60,62,67-117, all partially

Inventions 454 and 455: Idem as subject 1 but limited to each of the DNA sequences as in Seq.ID:546 and 548, where invention 454 is limited to Seq.ID:546 and corresponding polypeptides encoded thereby, and invention 455 is limited to Seq.ID:548 and corresponding polypeptides encoded thereby.

Invention 456: claims 1-10,12,17-32,34,39-51,53, 58-60,62,67-117, all partially

Idem as subject 1 but limited to each of the DNA sequences as in Seq.ID:550, 552, 556, 558 and 560 and corresponding polypeptides encoded thereby.

Inventions 457-582: claims 1-10,12-14,17-32,34-36, 39-51,53-55,58-60,62-64,67-117, all partially (1)

Inventions 457-582: Idem as subject 1 but limited to each of the DNA sequences as in Seq.ID:562-586 (even numbers),

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588-683,686,687,689,691,692,692, and 696-706, where invention 457 is limited to Seq.ID:562 and corresponding polypeptides encoded thereby, invention 458 is limited to Seq.ID:564 and corresponding polypeptides encoded thereby,....., and invention 582 is limited to Seq.ID:706 and corresponding polypeptides encoded thereby.

Invention 583: claims 1-10,14,17-32,36,39-51,55, 58-60,64,67-117, all partially

Idem as subject 1 but limited to each of the DNA sequences as in Seq.ID:707, 709, 711 and 712 and corresponding polypeptides encoded thereby.

Inventions 584-592: claims 1-117, all partially (1)

Inventions 584-592: Idem as subject 1 but limited to each of the DNA sequences as in Seq.ID:799-815 (odd numbers), where invention 584 is limited to Seq.ID:799 and corresponding polypeptides encoded thereby, invention 585 is limited to Seq.ID:801 and corresponding polypeptides encoded thereby,....., and invention 592 is limited to Seq.ID:815 and corresponding polypeptides encoded thereby).

For the sake of conciseness, the subject matter of the first invention is explicitly defined, the other subject matters are defined by analogy thereto.

(1) In as far as the claims searched for a group of inventions refer to specific groups of sequences, only those claims which refer to the groups comprising the nucleic acid sequence of a particular invention, and/or its corresponding polypeptide sequence(s), form parts of that invention.

Due to the fact that extensive sequence homologies were found between several groups of sequences during the additional searches, some of the sequences have been grouped, whereby each of these groups comprising two or more such homologous sequences is considered to be one invention.

Claims searched during primary and additional searches: 1-14,17-36,39-55,58-64,67-117, limited to:

Invention 1, seq.ID.1

Invention 52, seq.ID.111, and 112 (transl.)

Invention 61; seq.ID.129, and 130 (transl.)

Invention 71, seq.ID.149, and 150 (transl.)

Invention 72, seq.ID.151, and 152 (transl.)

Invention 116, seq.ID.206

Invention 120, seq.ID.211 and 329; (related sequences)

Invention 137, seq.ID.228

Invention 139, seq.ID.330

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Invention 219, seq.ID.411
Invention 453, seq.ID.544, and 545 (transl.),
and seq.ID.554, and 555 (transl.);
(related sequences)
Invention 454, seq.ID.546, and 547 (transl.)
Invention 455, seq.ID.548, and 548 (transl.)
Invention 456, seq.ID.550, and 551 (transl.),
and seq.ID.552, and 553 (transl.),
and seq.ID.556, and 557 (transl.),
and seq.ID.558, and 559 (transl.),
and seq.ID.560, and 561 (transl.);
(related sequences)
Invention 547 seq.ID.665
Invention 548, seq.ID.666
Invention 554, seq.ID.672
Invention 558, seq.ID.676
Invention 563, seq.ID.681
Invention 566, seq.ID.686
Invention 583, seq.ID.707, and 708 (transl.),
and seq.ID.709, and 710 (transl.),
and seq.ID.711,
and seq.ID.712;
(related sequences).

INTERNATIONAL SEARCH REPORT

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